

ABSTRACT OF THE DISCLOSURE

A method and apparatus for reducing speckle uses polarization averaging. A polarizing beam splitter divides a first polarized laser output into a second polarized laser output and a third polarized laser output. A plurality of mirrors creates an optical path difference between the second and third polarized laser outputs. The optical path difference is at least about a coherence length for the first polarized laser output. The second and third polarized laser outputs are combined into a fourth laser output, which illuminates a depolarizing screen. If a human eye or an optical system having a intensity detector views the depolarizing screen, the eye or the intensity detector will detect reduced speckle, which results from uncorrelated speckle patterns created by the second polarized laser output and the third polarized laser output. A first alternative embodiment of the invention functions without the optical path difference being at least about the coherence length. In the first alternative embodiment, a piezoelectric transducer varies an optical path length by at least about a half wavelength of the first polarized laser output. By varying the optical path length by a sufficient frequency, the eye or the intensity detector will detect the reduced speckle. A second alternative embodiment combines two orthogonally polarized laser outputs, from two lasers, into a combined laser output. The combined laser output illuminates the depolarizing screen. A third alternative embodiment rotates the first laser output with a rotation frequency to form a rotating polarized laser output, which illuminates the depolarizing screen.